REMARKS

The Office Action dated April 11, 2006 has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

Claims 1-5 and 8-18 been amended to more particularly point out and distinctly claim the subject matter of the invention. Claims 6, 7, and 19-23 have been cancelled. Claims 24-27 have been added. No new matter has been added. 1-5, 8-18 and 24-27 are submitted for consideration.

Claims 1-7 and 9-23 were objected to because of formalities. Claims 1-7 and 9-23 have been amended to overcome the objection. Therefore, Applicants request that the objection be withdrawn.

Claims 1-23 were rejected under 35 U.S.C. 101 on the grounds that the claims are directed to non-statutory subject matter. Claims 1-23 have been amended to overcome the rejection. Therefore, Applicants request that the rejection be withdrawn.

Claims 1-24 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Publication No. 2002/0169867 to Mann (hereinafter Mann). The rejection is traversed as being based on a reference that neither teaches nor suggests the novel combination of features clearly recited in claims 1-24.

Claim 1, upon which claims 2-5 depend, recites a method including receiving, in at least one second computer node of a computer cluster, periodic heartbeat messages from a first computer node of the computer cluster. Each of the at least one second computer

Application No.: 10/630,972

nodes includes at least one resource for performing at least one cluster-specific task. The method also includes transmitting heartbeat acknowledgment messages from the at least one second computer node to the first computer node as responses to the heartbeat messages to indicate to the first computer node that the at least one second computer node is operative within the computer cluster. The method further includes receiving, in at least one of the second computer nodes, state information for any one or more of the heartbeat acknowledgment messages. The state information is indicative of an ability of the at least one resource to perform the at least one cluster-specific task. The method also includes sending the state information in one or more of the heartbeat acknowledgment messages to the first computer node for storing the state information in the first computer node.

Claim 8, upon which claims 9-12 depend, recites a computer cluster including a plurality of computer nodes, the computer cluster including a transmitting unit configured to transmit a heartbeat message from a first computer node of the computer cluster to a second computer node of the computer cluster. The second computer node includes at least one resource for performing at least one cluster-specific task. The computer cluster also includes a receiving unit configured to receive the heartbeat message in the second computer node and a retrieving unit configured to retrieve state information for a heartbeat acknowledgment message to be sent as a response to the heartbeat message, the state information indicating an ability of the at least one resource to perform the at least one cluster-specific task. The computer cluster further includes a sending unit configured to send the state information in the heartbeat acknowledgment message to the first computer

Application No.: 10/630,972

node and a storing unit in the first computer node configured to store the state information for managing the computer cluster.

Claim 13, upon which claim 14 depends, recites a computer node for a computer cluster, the computer node including at least one resource for performing at least one cluster-specific task and a receiving unit configured to receive a heartbeat message from another computer node. The computer node also includes a transmitting unit configured to transmit heartbeat acknowledgement messages to the other computer node as responses to the heartbeat messages to indicate to the other node that the computer node is operative within the computer cluster. The computer node further includes a retrieving unit configured to retrieve state information for any one or more of the heartbeat acknowledgment messages. The state information is indicative of an ability of the at least one resource to perform the at least one cluster-specific task. The computer node also includes a sending unit, responsive to the retrieving unit, configured to send the state information in any one or more of the heartbeat acknowledgment messages to the other computer node.

Claim 15, upon which claims 16-18 depend, recites a method including transmitting periodic heartbeat messages from a first computer node of a computer cluster to at least one second computer node of the computer cluster. Each of the at least second computer node includes at least one resource for performing at least one cluster-specific task. The method also includes awaiting receipt of heartbeat acknowledgment messages from the at least one second computer node as a response to a heartbeat message. The

Application No.: 10/630,972

heartbeat message is any of the heartbeat messages and the heartbeat acknowledgment message indicates that the at least one second computer node is operative within the computer cluster. ' The method further includes receiving the heartbeat acknowledgment message including state information indicative of an ability of the at least one resource to perform the at least one cluster-specific task and storing the state information for managing the computer cluster.

As outlined below, the cited reference of Mann does not teach or suggest the all of the elements of the pending claims.

Mann discloses a management and maintenance system for a data communications network. In this system, the service and control adapters located in the nodes periodically generate "heartbeat" events that are operational status signals indicating that the respective service or node is operational or alive. The operational status signals, which may also report other essential sustaining information, are received by a controlling host at a network operation center, that is, by the network management system. The service and control adapters further generate exception events which inform the controlling host of an abnormal situation within the corresponding service or node. The heartbeat and exception events are generated independently by the service and control adapters, that is, without the involvement of the controlling host.

According to Mann, if nodes or services are started manually in the network, that is, without a command to do so from the network management system, the newly started node or service starts to generate heartbeat events which include the identity of the

Application No.: 10/630,972

sender. When the network management system, which receives all heartbeat events, fails to recognize the identity of the sender, it generates a discover event that requests the unknown node or service to provide identity information. The newly added node or service responds with an identity event including identity information of the respective node or service. The discover event may also request status performance data from the newly added node or service. In this case the newly added node or service responds with a status event including a report of the performance of the node or service.

Applicants submit that Mann does not teach or suggest each of the elements of the pending claims. The Office Action takes a position that the heartbeat message, as recited in the pending claims are equivalent to the discover event of Mann, since the discover event requests a response from the other host. Consequently, the Office Action further alleged that the status event including the status performance data of Mann corresponds to the heartbeat acknowledgement message of the present claims, which includes state information indicative of the ability of a resource of the respective computer node to perform cluster-specific tasks. Thus, the Office Action takes the position that all of the elements of the pending claims are disclosed in Mann.

Mann does not teach or suggest using the intrinsic heartbeat mechanism of a computer cluster for collecting state information from the computer nodes. In Mann, the discover event is produced only in response to the detection of an unknown node or service and therefore the status performance data may be obtained only from a node or service that has been started manually in the network and the status event is generated

Application No.: 10/630,972

only once by the node or service. This is clearly different from the periodic and continuous data collection recited in the present claims.

Therefore, Applicants submit that utilizing the intrinsic heartbeat mechanism of a computer cluster for collecting data indicative of the ability of the cluster resources to perform clusterspecific tasks is neither taught nor suggested in Mann. Moreover, the benefits of the present invention cannot be achieved in the Mann system, that is, real time data collection without excessively loading the network/nodes, c£ the specification of the present application.
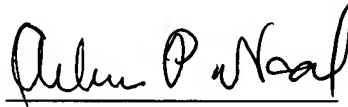
Therefore, Applicants respectfully asserts that the rejection under 35 U.S.C. §102(e) should be withdrawn because Mann does not teach or suggest each feature of claims 1, 8, 13 and 15 and hence, dependent claims 2-5, 9-12, 14, and 16-18 thereon.

As noted previously, claims 1-5, 8-18 and 25-27 recite subject matter which is neither disclosed nor suggested in the prior art references cited in the Office Action. It is therefore respectfully requested that all of claims 1-5, 8-18 and 25-27 be allowed and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

Application No.: 10/630,972

In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,

Arlene P. Neal
Registration No. 43,828

Customer No. 32294
SQUIRE, SANDERS & DEMPSEY LLP
14TH Floor
8000 Towers Crescent Drive
Tysons Corner, Virginia 22182-2700
Telephone: 703-720-7800
Fax: 703-720-7802

APN:ksh

Enclosures: Additional Claim Fee Transmittal
Check No. <u>16702</u>

Application No.: 10/630,972